

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

**Response Under 37 CFR § 1.116**

Alastair M. Reed

**Expedited Procedure**Application No.: **10/613,913**

Art Unit: 2624

Filed: July 3, 2003

Confirmation No.: 4658

For: COLOR ADAPTIVE  
WATERMARKING**Via Electronic Filing**

Examiner: G. Desire

Date: September 13, 2006

**APPEAL BRIEF**

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Sir:

Appellants respectfully request the Board of Patent Appeals and Interferences (hereafter the "Board") to reverse the outstanding final rejection of the pending claims.

This Appeal Brief is in furtherance of a Notice of Appeal filed July 19, 2006. Please charge the fee required under 37 CFR 1.17(f) or any other fee needed to consider this Appeal Brief to our deposit account 50-1071.

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**REAL PARTY IN INTEREST**

The real party in interest is Digimarc Corporation, by an assignment from the inventors recorded at Reel 014942, frames 0408-0410, on February 2, 2004.

**RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

**STATUS OF CLAIMS**

Claims 11-18 are pending in the present application. Each of these claims stand finally rejected. Please see the Office Action Summary in the final Office Action mailed March 22, 2006 – hereafter referred to as “the final Office Action”.

**STATUS OF AMENDMENTS**

All earlier-filed amendments have been entered.

**SUMMARY OF CLAIMED SUBJECT MATTER**

The present invention generally relates to digital watermarking and color image processing.

Digital watermarking may be used to modify media content (e.g., color images) to embed a message or machine-readable code into the content. The content is modified such that the embedded code is imperceptible or nearly imperceptible to the user, yet may be detected through an automated detection process. Please see the specification, e.g., at page 5, line 10 – page 6, line 16.

Independent claim 14 recites a method of encoding a color image with an auxiliary signal, wherein the auxiliary signal comprises encoding values (see, e.g., page 53, lines 8-10; see also page 8, line 11 – page 12, line 15), and wherein the color image comprises an array of color values (see, e.g., page 53, lines 10-15). The method includes: providing a set of encoding values for an image sample (see, e.g., page 53, lines 10-15); determining a color characteristic for the

image sample based on its color values (see, e.g., page 54, line 1 – page 55, line 19); and selectively scaling (see, e.g., page 9, lines 20-22) color values in the image sample based on the color characteristic (see, e.g., page 54, line 1 – page 55, line 19).

Independent claim 11 recites a method to encode an image with a digital watermark (see, e.g., page 8, line 11 – page 12, line 15). The image includes a plurality of color channels, the method includes: determining a color characteristic for a group of image samples (see, e.g., page 57, lines 9-11); based at least in part on the characteristic, determining for the group of image samples which of the plurality of color channels should receive encoding (see, e.g., page 57, lines 11-15); transforming from the group of image samples at least one determined color channel that should receive encoding into a transform domain (see, e.g., page 57, lines 16-18); and altering transform domain coefficients of the at least one determined color channel to encode the digital watermark (see, e.g., page 57, lines 18-19).

#### **GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

1. Claims 14 - 18 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,818,032 (hereafter “the Sun patent”) in view of U.S. Patent No. 6,777,931 (hereafter “the Takada patent”).
2. Claims 11 and 12 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,788,801 (hereafter “the Liao patent”) in view of U.S. Patent No. 6,125,200 (hereafter “the Warnock patent”).
3. Claim 13 stands finally rejected under 35 U.S.C. 103(a) as being unpatentable over the Liao patent and the Warnock patent in view of U.S. Patent No. 6,252,971 (hereafter “the Wang patent”).

**ARGUMENT**

Appellants respectfully request that the final rejection of the pending claims be reversed since the applied references fail to teach or suggest all of the elements of the pending claims.

***Rejections under U.S.C. 103(a) over the Sun patent in view of the Takada patent*****Claims 14 - 18**

Independent claim 14 recites:

*14. A method of encoding a color image with an auxiliary signal, wherein the auxiliary signal comprises encoding values, and wherein the color image comprises an array of color values, said method comprising:*

*providing a set of encoding values for an image sample;*

*determining a color characteristic for the image sample based on its color values; and selectively scaling color values in the image sample based on the color characteristic.*

The Takada patent does not teach *encoding a color image with an auxiliary signal*, e.g., through digital watermarking. Please see the specification at, e.g., page 1, lines 16-20. The final Office Action does not address this feature with respect to claim 14.

Claim 14 also recites – in combination with other features – “*determining a color characteristic for the image sample based on its color values, and selectively scaling color values in the image sample based on the color characteristic.*” This is in the context of encoding a color image with an auxiliary signal.

The final Office Action relies on the Takada patent to teach *selectively scaling color values in the image sample based on the color characteristic.* Please see the final Office Action, page 5, lines 9-11 of paragraph 7.

The final Office Action suggests that the Takada patent is “concerned with color” since a magnitude of a signal is displayed with a black line. See the final Office Action at page 3, lines 1-4 (citing the Takada patent at Col. 1, lines 38-39). But the cited Col. 1 passage deals with a magnitude of a signal obtained by a surface flaw testing probe – provided to probe a material like metal.

The cited passages are not concerned with the material’s (or, by analogy to claim 14, an image’s) color characteristic. Instead, the Takada patent uses color as a **display technique** to represent surface flaws, e.g., cracks in metal (the Takada patent at Col. 2, lines 19-24).

The only other cited passage of the Takada patent - Col. 2, lines 32-40 - suggests changing a display color (see Col. 2, lines 30-31) or depth of the display color based on a magnitude of a probe signal (Col. 2, lines 37-38), and not based on the material’s color characteristics. These passages are concerned with how to best **display** flaws or cracks in materials to a viewer via a color representation, and not with *selectively scaling color values in the image sample based on the color characteristic*.

Moreover, the Col. 2, lines 32-38 passage does not teach any *selective scaling of color values*. Instead, this passage would merely select a display color based on the test probe signal, without then scaling the selected display color.

We also object to the proposed combination of the Takada patent with the Sun patent as suggested in the final Office Action. Please see the final Office Action on page 6, lines 4-7. The Takada patent is related to displaying a signal obtained by a measuring probe, e.g., showing surface flaws of a cylindrical body of metal such as a rolling roll. See, e.g., the Takada patent at Col. 1, lines 16-21. In contrast, the Sun patent is related to encoded color halftone microdots. There appears to be no motivation to combine these references as suggested, nor do we believe an artisan in one of these fields (e.g., measuring surface flaws) would be motivated to consult the other field (e.g., encoding halftone microdots) when looking for improvements.

We respectfully request that the final rejection of claim 14 be reversed.

***Formal Rejections under 35 U.S.C. 103(a) over the Liao patent in view of the Warnock patent***

**Claims 11 - 13**

Independent claim 11 recites:

*11. A method to encode an image with a digital watermark, wherein the image comprises a plurality of color channels, said method comprising:*

*determining a color characteristic for a group of image samples;*

*based at least in part on the characteristic, determining for the group of image samples which of the plurality of color channels should receiving encoding;*

*transforming from the group of image samples at least one determined color channel that should receive encoding into a transform domain; and*

*altering transform domain coefficients of the at least one determined color channel to encode the digital watermark.*

Claim 11 recites, in combination with other features, determining a color characteristic for a group of image samples, and based at least in part on the color characteristic, determining for the group of image samples which of the plurality of color channels should receiving encoding.

The cited passages of the Warnock patent (see, e.g., Col. 3, lines 8-13) do not determine a color characteristic associated with a group of image samples, and then based on that color characteristic, determine which of a plurality of color channels should receiving encoding.

The Warnock patent would determine a color channel based on text color (see Col. 3, lines 8-13: "Thus, if the text is black, then the K channel in the CMYK color space is selected."). But this text color is not used to determine which of a plurality of color channels should receive encoding (e.g., a digital watermark).

The Liao patent is also deficient in this regard. The cited passage of the Liao patent at Col. 3, lines 47-50 suggests that different types of images (e.g., color and black and white) can be handled by the Liao system in different embodiments. But this passage does not say whether particular image samples are analyzed to determine a color characteristic associated with image samples, or whether a color characteristic is used to determine which color channel should receive encoding.

Thus, even if combined as suggested, the art as applied would not teach or suggest the combination recited in claim 11, including at least determining, based at least in part on a color characteristic, which of a plurality of color channels should receive encoding.

We respectfully request that the final rejection of claim 11 be reversed.

#### **CONCLUSION AND REQUEST FOR REVERSAL**

The cited references collectively fail to teach all of the limitations of the pending claims, and at least some of the references should not be combined as suggested and noted above. (Other deficiencies of the art need not be further belabored at this time.) As such, the claims are patentable over the cited references.

Appellants respectfully request that the Board reverse the final rejection of the pending claims.

Date: September 13, 2006

Respectfully submitted,

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**CLAIMS APPENDIX**

11. (previously presented): A method to encode an image with a digital watermark, wherein the image comprises a plurality of color channels, said method comprising:  
determining a color characteristic for a group of image samples;  
based at least in part on the characteristic, determining for the group of image samples which of the plurality of color channels should receive encoding;  
transforming from the group of image samples at least one determined color channel that should receive encoding into a transform domain; and  
altering transform domain coefficients of the at least one determined color channel to encode the digital watermark.

12. (previously presented): The method of claim 11, further comprising transforming an altered color channel into a spatial domain.

13. (original): The method of claim 11, where the characteristic identifies which of the color channels will best hide the digital watermark in terms of visibility.

14. (original): A method of encoding a color image with an auxiliary signal, wherein the auxiliary signal comprises encoding values, and wherein the color image comprises an array of color values, said method comprising:

providing a set of encoding values for an image sample;  
determining a color characteristic for the image sample based on its color values; and  
selectively scaling color values in the image sample based on the color characteristic.

15. (original): The method of claim 14, wherein scaling effects a change in luminance.

16. (original): The method of claim 15, wherein the scaling comprises a scale to black.

17. (original): The method of claim 15, wherein the scaling comprises a scale to white.

18. (original): The method of claim 14, wherein the color characteristic comprises yellow content.

**EVIDENCE APPENDIX**  
**(No Evidence)**

**RELATED PROCEEDINGS APPENDIX**  
**(No Related Proceedings)**